

REMARKS

Claims 13, 21, 23-31, and 35-37 are currently pending in this application, with claims 23-31 being withdrawn from consideration. Claims 13, 21, 35 and 36 have been amended, and new claim 37 has been added. Claims 1-12, 14-20, 22, and 32-34 have been cancelled. Support for these amendments can be found throughout the original specification, for example at page 15, paragraph [0069], in Figs. 2-3, cancelled claim 4, and in the Examples. No new matter has been added.

Independent claim 13, as amended, is directed to a method of manufacturing green coffee beans to which brewing aroma is added, comprising a fermentation process of bringing green coffee beans, which are unground seeds from coffee berries, a yeast suspension containing brewers yeast in an amount of 1.0×10^8 cells/g - 1.0×10^{10} cells/g per weight of the green coffee bean, and a nutritive substance comprising at least one of fruit juice and fruit pulp, the nutritive substance being metabolized by said brewers yeast, into contact with one another to cause fermentation for at least 48 hours to allow the green coffee beans to absorb brewing aroma of at least one of alcohols and esters produced by the fermentation and enhance the brewing aroma of the green coffee beans; and a separation process of separating out only said green coffee beans that have passed through the fermentation process.

Independent claim 21, as amended, is directed to a method of manufacturing roasted coffee beans to which brewing aroma is added, comprising a fermentation process, a separation process and a roasting process. The fermentation process includes bringing green coffee beans, which are unground seeds from coffee berries, a yeast suspension containing brewers yeast in an amount of 1.0×10^8 cells/g - 1.0×10^{10} cells/g per weight of the green coffee bean, and a nutritive substance comprising at least one of fruit juice and fruit pulp, the nutritive substance being metabolized by said brewers yeast, into contact with one another to cause fermentation for at least 48 hours, to allow the green coffee beans to absorb brewing aroma of at least one of alcohols and esters produced by the fermentation and enhance the brewing aroma of the green coffee beans. The separation process includes separating out only said green coffee

beans that have passed through the fermentation process; and the roasting process includes roasting said green coffee beans that have been obtained in said separation process.

Independent claim 35 is directed to a method of manufacturing coffee drip extract to which brewing aroma is added, comprising a fermentation process, a separation process, a roasting process, and a filtering and extracting process. The fermentation process includes bringing green coffee beans, which are unground seeds from coffee berries, a yeast suspension containing brewers yeast in an amount of 1.0×10^8 cells/g - 1.0×10^{10} cells/g per weight of the green coffee bean, and a nutritive substance comprising at least one of fruit juice and fruit pulp, the nutritive substance being metabolized by said brewers yeast, into contact one another to cause fermentation for at least 48 hours, to allow the green coffee beans to absorb brewing aroma of at least one of alcohols and esters produced by the fermentation and enhance the brewing aroma of the green coffee beans. The separation process includes separating out only said green coffee beans that have passed through the fermentation process. The roasting process includes roasting green coffee beans that have been obtained in said separation process to obtain roasted coffee beans to which brewing aroma is added; and the filtering and extracting process includes grinding up and adding water to the roasted coffee beans to which brewing aroma is added, then extracting said water by filtration with a filter.

Independent claim 36 is directed to a method of manufacturing a canned coffee beverage, comprising a fermentation process, a separation process, a roasting process, a filtering and extraction process, and a heat sterilizing process. The fermentation process includes bringing green coffee beans, which are unground seeds from coffee berries, a yeast suspension containing brewers yeast in an amount of 1.0×10^8 cells/g - 1.0×10^{10} cells/g per weight of the green coffee bean, and a nutritive substance comprising at least one of fruit juice and fruit pulp, the nutritive substance being metabolized by said brewers yeast, into contact with one another to cause fermentation for at least 48 hours, to allow the green coffee beans to absorb brewing aroma of at least one of alcohols and esters produced by the fermentation and enhance the brewing aroma of the green coffee beans. The separation process includes separating out only said green coffee beans that have passed through the fermentation process. The roasting process includes roasting green coffee beans that have been obtained in said separation process to obtain roasted

coffee beans to which brewing aroma is added. The filtering and extracting process includes grinding up and adding water to the roasted coffee beans to which brewing aroma is added, then extracting said water by filtration with a filter; and the heat sterilizing process includes filling a container with a drip extract that has been obtained through said extracting process, followed by heating and sterilization.

35 U.S.C. § 103(a) Rejections

Claim 13 stands rejected under 35 U.S.C. § 103(a) for obviousness over United States Patent No. 2,321,148 to Kirby et al. ("Kirby") in view of United States Patent No. 4,867,992 to Boniello et al. ("Boniello"). Claim 21 stands rejected under 35 U.S.C. § 103(a) for obviousness over Kirby in view of Boniello and United States Patent No. 6,660,322 to Zapp et al. ("Zapp"). Claim 35 stands rejected under 35 U.S.C. § 103(a) for obviousness over Kirby in view of Boniello, Zapp and United States Patent No. 5,267,507 to Enomoto ("Enomoto"). Claim 36 stands rejected under 35 U.S.C. § 103(a) for obviousness over Kirby in view of Boniello, Zapp, Enomoto and United States Patent No. 6,054,162 to Bradbury et al. ("Bradbury").

Kirby is directed to the fermentation of "pulped green coffee" to remove the remaining mucilaginous coating. *See Kirby*, page 1, col. 1, lines 9-14. The process of Kirby is applied to beans which result from the removal of the outermost skin and underlying fruit pulp of coffee berries (or cherries) to expose a green bean covered in mucilage. Kirby notes that the purpose of the invention disclosed therein is to easily remove such mucilage from pulped green coffee beans. According to Kirby, pulped coffee beans are combined with yeast, or a yeast-malt composition, and then fermented in order to facilitate easy removal of the mucilaginous coating. The Kirby fermentation is performed at a temperature of 26.5°C to 36°C for a period of approximately 15 to 30 hours. *See Kirby*, page 1, col. 2, lines 9-12. The Kirby process allegedly decreases the period of time usually required to remove the mucilaginous coating. Further, it prevents the growth or propagation of bacteria.

The present invention, however, addresses a different problem than that of Kirby. In independent claims 13, 21, 35, and 36, in order to obtain green coffee beans with enhanced brewing aroma such as esters and alcohols, fermentation is performed for a long period of time (48 hours) using a specific amount of the brewers yeast (1.0×10^8 cells/g - 1.0×10^{10} cells/g per

weight of green coffee bean) and fruit juice or fruit pulp. Accordingly, brewing aroma of esters, alcohols and the like are produced, and the flavor component thereof is absorbed by the green coffee beans, thereby adding excellent flavor to the roasted coffee bean obtained from such green coffee beans, coffee drip extract, and canned coffee beverage obtained by retort sterilization. *See* Embodiments 1-8 of the present specification.

This is unlike the problem to be solved in Kirby, in which fermentation is performed using yeast and malt for the purpose of efficiently removing mucilage after short term fermentation. Kirby simply fails to address the issues solved by the present invention, wherein green coffee beans are allowed to absorb brewing aroma. Moreover, Kirby is totally silent with respect to any specific range of brewer's yeast concentration, let alone a concentration of 1.0×10^8 cells/g - 1.0×10^{10} cells/g per weight of the green coffee bean, as claimed. Kirby also fails to teach or suggest the addition of a nutritive substance to be metabolizable by the brewers yeast and roasting coffee beans.

Boniello discloses a method for manufacturing a natural buttery and/or winey flavor of which diacetyl and acetoin are the major flavor components, from a coffee substrate. This manufacturing method includes: (a) preparing a nutritional medium containing water and at least 0.5% of soluble coffee solid as a sole nutritional component; (b) adding lactic acid-producing bacteria or diacetyl-producing microorganism (yeast) to the nutritional medium; and (c) fermenting the coffee solid to form the natural flavor. *See* Boniello, col. 2, lines 5-35. Boniello explains that the substrate may include ground green coffee beans, coffee pulp, mucilage, husks and spent grounds. *See* Boniello, col. 2, lines 57-60. However, according to the description (especially the Examples) of Boniello, a coffee extract (0.75-25% coffee solids, *see* col. 2, line 64) was used as the nutritional medium containing the soluble coffee solid, into which microorganisms were inoculated to cause fermentation. In addition, the object of Boniello is to collect diacetyl and acetoin as a product of the fermentation, using known means (such as distillation), and to add them to soluble coffee products (soluble coffee) or roasted and ground coffee beans to enhance the flavor.

On the other hand, as presently claimed in amended independent claims 13, 21, 35 and 36, fermentation is performed by adding a yeast suspension containing a specific amount of

the brewers yeast to coffee beans - not a low concentration of coffee solids (0.75-25%), as disclosed in Boniello - and fruit pulp or fruit juice as nutritive substance. A coffee bean in general has a property of absorbing water in preparation for germination. *See* paragraph [0018] of the present specification. As presently claimed, by adding a yeast suspension containing brewers yeast and performing fermentation, produced flavor components (brewing aroma) such as alcohols and esters, together with moisture, are rapidly absorbed by green coffee beans, and thus green coffee beans are enriched with brewing aroma and are without off-flavor. *See* Embodiments 1-8 of the present specification.

The object of Boniello is to produce a flavor to be used as an additive, which is different from the present invention as claimed, wherein flavor is added during processing of the green coffee beans themselves. *See* claims 13, 21, 35, and 36 of the present application. Thus, in the present invention, it is unnecessary to separate and collect the flavor component produced by fermentation, or to add the flavor component to coffee products.

Accordingly, Boniello, either alone or in combination with Kirby, fails to teach or suggest any way of accomplishing absorption of brewing aroma by green coffee beans during processing of the green coffee beans. Moreover, like Kirby, Boniello is completely silent with respect to the specific claimed concentration of yeast suspension of 1.0×10^8 cells/g - 1.0×10^{10} cells/g per weight of the green coffee bean. Boniello also does not teach bringing that suspension into contact with the nutritive substance metabolizable by the brewers yeast, as is required by claims 13, 21, 35, and 36. Nor does Boniello disclose roasting coffee beans.

Zapp discloses a method for processing cacao beans and a product obtained therefrom, with the purpose of retaining flavonoid content in cacao beans, which flavonoid is beneficial for health reasons. Specifically, Zapp discloses a method that enhances polyphenol content in foodstuffs that use cacao raw material. *See* Zapp, col. 2, line 60-col. 3, line 5. The method includes immersing cacao beans in heated soak water; removing the cacao beans from the soak liquid; roasting (or fermenting) the cacao beans; and adding the separated soak liquid to quench the roasted cacao beans. *See, e.g.,* Zapp, Examples 1-3.

Zapp describes that, by separating the soak liquid prior to roasting or fermentation and then adding it back after roasting or fermentation, polyphenol can be enhanced, but there is no specific description with respect to fermentation. Examples 1-3 of Zapp describe that green coffee beans are soaked, roasted and quenched with the soak liquid, but are silent with respect to fermentation. As independent claims 13, 21, 35 and 36, as amended, indicate, fermentation is performed by adding a yeast suspension containing a specific amount of the brewers yeast to coffee beans in the presence of fruit pulp or fruit juice as a nutritive substance. A coffee bean, in general, has a property of absorbing water in preparation for germination. *See* paragraph [0018] of the present specification. By adding a yeast suspension containing brewers yeast and performing fermentation, flavor components (brewing aroma) such as alcohols and esters, together with moisture, are rapidly absorbed by green coffee beans, are, thus, enriched with brewing aroma and are without off-flavor. *See* Embodiments 1-8 of the specification.

On the other hand, Zapp describes only fermentation of cacao beans, but is silent with respect to fermentation of green coffee beans. *See* Zapp, Examples 1-3. Additionally, like Boniello and Kirby, Zapp fails to teach or suggest, in any manner, absorption of brewing aroma by green coffee beans. Moreover, Zapp is completely silent with respect to the yeast concentration of 1.0×10^8 cells/g - 1.0×10^{10} cells/g per weight of the green coffee bean and metabolization of a nutritive substance by the brewers yeast.

None of the other cited references teach or suggest the limitations of claims 13, 21, 35, and 36, nor do they cure the above-described deficiencies of Kirby, Boniello and Zapp.

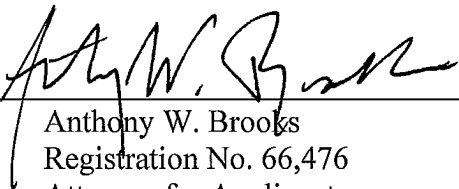
In view of the above, a person of ordinary skill in the art would not have found it obvious to combine the cited references because those references, taken either separately or in combination, address problems different than that of the presently claimed invention. Moreover, taken either separately or in combination, they fail to teach or suggest the features of the claimed invention. These references fail to teach or suggest, among other things, that a yeast suspension containing brewers yeast in an amount of 1.0×10^8 cells/g - 1.0×10^{10} cells/g per weight of green coffee bean and a nutritive substance, which is metabolizable by the brewers yeast, are brought into contact with each other. Thus, even in combination, these references do not teach the present invention, as claimed in independent claims 13, 21, 35 and 36.

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Accordingly, independent claims 13, 21, 35 and 36 are not rendered obvious by the cited references and, therefore, define patentable subject matter. Claim 37 depends directly from and includes all the features of independent claim 21, and, therefore, also defines patentable subject matter.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejections and allowance of claims 13, 21 and 35-37.

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